

DEASON

Classification of Wheat Varieties

Agriculture

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CLASSIFICATION OF WHEAT VARIETIES

BY

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THESIS FOR THE DEGREE OF BACHELOR OF SCIENCE

IN THE

COLLEGE OF AGRICULTURE

OF THE

UNIVERSITY OF ILLINOIS

JUNE 1, 1906





1906  
D34

UNIVERSITY OF ILLINOIS

June 1, 1906.

THIS IS TO CERTIFY THAT THE THESIS PREPARED UNDER MY SUPERVISION BY

Francis Ellery Deason

ENTITLED CLASSIFICATION OF WHEAT VARIETIES

IS APPROVED BY ME AS FULFILLING THIS PART OF THE REQUIREMENTS FOR THE DEGREE

OF Bachelor of Science

Cyril G. Hopkins

HEAD OF DEPARTMENT OF Agronomy





## CLASSIFICATION OF WHEAT VARIETIES.

The purpose of this thesis is to make a practical classification of certain varieties of wheat which are advertised by seedsmen in different parts of the United States.

Among the many alleged varieties which are now found on the market a varying amount of confusion must necessarily exist. The same varieties are handled by different seedsmen in different localities and there is a possibility that the same varieties may be sold in different places under different names. The opposite is also true; different seedsmen may sell entirely different varieties to which they attach the same name. In view of this fact, therefore, it is a part of the work of this thesis to determine whether or not any such confusion exists among certain of the many varieties offered for sale in Illinois.

With the intent to classify varieties and to detect the above mentioned confusion should any exist, an attempt was made to secure seed from about twenty different sources. As a result of making inquiry of these sources eighteen seedsmen responded, each sending one or more samples which were sufficiently large to seed small plots of land, .004 acre in area, which were located upon series 700 of the north farm of the Illinois Experiment Station.

The name and address of each seedsman or seed firm furnishing samples is as follows:

Jones "The Wheat Grower"

U.S.Dep't of Agriculture

Leroy, New York

Washington, D.C.



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J.A.Burns	Bedford, Ohio (Box 307)
Homes Seed Co.	Harrisburg, Penn.
Experiment Station	Urbana, Illinois
Henderson Seed Co.	35, 37 Cortlandt St., New York, N.Y.
H.G.Easterly	Murphysboro, Illinois✓
Soil Experiment Field	Galesburg, Illinois
Peterson and Co.	Maplelawn Farm, Xenia, Ohio
J.M.Thornburn	36 Cortlandt St., New York, N.Y.
E. C. Detmer	R.F.D. No. 8, Napoleon, Ohio.
L.R.Kuney	Adrian, Michigan
Harvey Seed Co.	65 Elliot St., Buffalo, N.Y.
A.A.Berry Seed Co.	Des Moines, Ia.
B.A.Lockwood	Des Moines, Ia.
L.L.Olds Seed Co.	Clinton, Wis.
Griswold Seed Co.	Lincoln, Neb.

The strip of ground upon which these varieties were sown lies about two hundred yards west from the eastern boundary of the farm and just west of the artificial forestry, and as before mentioned each variety was sown on a strip of ground .004 acre in area. These plots were eight rods long by sixteen inches wide. The dimensions give more exactly - ✓ acres. The difference, however, between this fraction and .004 is one square foot and one hundred and ten square inches, or figuring a yield of forty bushels per acre the difference would be one tenth of a pint per plot which is for all practical purposes much too small to be considered. On account of the late arrival of the seed of some of the varieties not all of the plots were sown on the same day. Plots 1-16 were sown September 29; 17-34, September 30 and 34-35 October 5, 1905.





Each fifth plot was used as a check plot, i. e. was sown to the same variety of wheat which was obtained from the same source. The use of these plots practically eliminated the slight error introduced by the different dates of sowing. Their main use, however, was to correct any variation in yield or other quality of the varieties, should there be any, due to either the physical condition or the fertility of the soil. At each end of the series, i.e. outside plots 1,55, was sown a narrow strip of wheat of the same variety as that sown in the check plots.

Plots 1, 5, and each succeeding multiple of five up to and including plot 30 were used as check plots. At plot 34 a miscalculation of plots already sown caused an error. The check variety which should have been sown on plot 35 was sown on plot 34 which had already been sown to another variety. This mixed the varieties, caused a double seeding, and destroyed the value of the plot in the experiment. By continuing the series as before the check would now fall on plots 39,44,49,54. The variety first sown on plot 34 was sown just outside the last check plot, making in all, 55 plots, and 43 varieties of wheat. The following is the plan of the plots, showing the order of the varieties, etc.



Border

4.

Indiana Swamp

- 8 1/2 x 4

2 1/2 x 4

" "

Mixed Wheat

Rupert's Giant

Indiana Swamp (Check)

Turkey Red

Dawson's Golden Chaff

Fultz Mediteranean

Silver Sheaf Longberry

(Check,

Turkey Red

Early Red Chief

Rural New Yorker No. 57.

Jones' Longberry

(Check)

Turkish Red

Clawson's Langberry

Gold Coin

Pedigree Giant

(Check)

Turkish Red

Diamond Grit

Rural New York No. 6

Malakoff

(Check)

Turkish Red

Dawson's Golden Chaff

No. 11603





Hungarian

5.

(Check,

Rudy

Wheedling

Harvest King

\*

Bulgarian

Mammoth Amber Giant

Fultzo Mediterranean

Corn Wheat

(Check,

Turkish Red

Silver Sheaf Longberry

Jones' Longberry

Fultzo Mediterranean

(Check)

Defiance Winter Wheat

Padi

New Wheat

K. B. No. 2

(Check)

Belgolina

Indiana Swamp

Red Hussar

Pesterboden

(Check,

Mealy Wheat

Border



The wheat was examined and described, i.e. classified according to a form outlined by Carl S. Scofield, Botanist at Washington, D. C., a very convenient set of tables now in use at the university, a copy of which will appear in this thesis.

It is not intended that any unreasonably small variation shall determine the untrueness to type or variety name of any of the varieties tested; for example, it has been fully established that a variety of any plant when moved from a warmer to a colder climate will change both in appearance and in composition. So with wheat; a northern grown variety when moved south will become lighter in color and will store a greater amount of starch under the tests, thus changing the composition of the grain and making it easier to crush. This, however, cannot happen in a single year and it is only in the case of a variety having thus been removed from its home and become acclimated that the excuse for a change may be considered. An apparent example of a change of this sort is to be found in the case of one of the varieties of Turkey Red, of this experiment. The variety had been grown at this station for a number of years. It compared quite uniformly in color and especially in size with the grain of the same variety name obtained from other and more northern sources, but it was much softer. Unfortunately no classification of this variety was made when it came to the station, but it is now much softer than varieties of the same name which are here for the first time.

The young stools of the first six varieties (plots) were classified Nov. 23, 1905, and the remainder, four days later. The first six plots were sown on ground that had been planted to potatoes the previous spring. The latter having been just recently dug, the





ground was in a higher state of tilth than the remaining plots and the plants were larger.

At the sowing of the last twenty-one plots, the varieties sown Sept. 29th, were just visible above the ground, those sown on the 30th were not. The wheat that was visible was on ground which had not been mellowed by potato culture. The remaining plots were on old oat stubble. The varieties sown on October 6th were much longer coming through the ground and three weeks later only single blades marked the place where grains were sown. About two weeks of warm weather then occurred and the plants grew more rapidly and the quicker growing varieties that were inclined to do so had all begun to stool.

The form as given by Scofield is useful in describing two species only; namely, *Triticum Aestivum* (vulgare) and *Triticum Durum*. Varieties of the other species are not cultivated in this country in sufficient numbers or quantity to be of much importance, therefore certain character divisions or stages in their growth are left out.

In addition to the number of divisions given in the form there will appear in this work a description of the seed of each variety. The classification will be the same as that given for the grain after the mature plant has been harvested and threshed.

The immediately following pages are a copy of the form as given by Scofield, after which will be found a description of the varieties in their order.



## CLASSIFICATION SHEET.

TRITICUM \_\_\_\_\_ SIZE OF PLOT \_\_\_\_\_

VARIETY NAME \_\_\_\_\_ OR NUMBER \_\_\_\_\_ FROM \_\_\_\_\_ 190 \_\_\_\_\_

## VARIETY DESCRIPTION

YOUNG STOOL

Spreading  
Partly Spreading  
Erect

## COLOR

Yellow Green  
Light Green  
Medium Green  
Dark Green  
Grey Green  
Purplish

## END OF BLADE

Tapering  
Sides parallel

## SHEATH

Green  
Green shading  
to purple

## LIGULE

Long  
Medium  
Short  
White  
Purple

## UPPER PART OF CLUM

Solid  
Semi-solid  
Hollow

## WALLS

Thick  
Medium  
Thin

## COLOR

Whitish  
Yellowish  
Purple  
Brownish

HALF GROWN PLANT

## COLOR

Light Green  
Medium Green  
Dark Green  
Light Yellowish Green  
Medium Yellowish Green  
Dark Yellowish Green  
Light Grey Green  
Medium Grey Green  
Dark Grey Green

## AURICLES

White  
Green  
White with  
purple tips  
Purple

## FOLIAGE

Scanty  
Medium  
Abundant

## RUST

Leaves %  
Stems %

## LEAF BLADE

## HAIRY

Partly hairy  
Smooth

## SMUT

Average length c.m.

Average width c.m.

Erect

Drooping

Ascending

Smooth

Scalrous

Downy

Glaucous

Not Glaucous

MATURE PLANT

Height c.m.

Strong

Medium

Weak

Diameter

below head m.m. bearded

Loose %

Stinking %

HEAD (Field Notes)

Beardless

Partly bearded

Bearded

## VEINS

Prominent  
Not prominent

## FURROWED

Medium  
Smooth

## ERECT

Leaning  
Nodding





## CLASSIFICATION SHEET (CONTINUED)

(HEAD)	Bluish	GLOSSY
	Brown	Medium
Date of appearance	Black	Dull
		Uniform in color
Date of flowering	AWNS	Streaked
Date of maturing	Long	SIZE
	Medium	
SHATTERING	Short	Broad
		Medium
Badly	SLENDER	Narrow
Medium	Medium	
None	Stout	LONG
		Medium
	ORDERLY	Short
HEAD (Lab. notes)	Medium	
	Irregular	ATTACHMENT
Length c.m.		
Very open	PARALLEL	Firm
Open	Spreading	Weak
Medium	Spreading widely	Medium
Compact		
Crowded	DECIDUOUS	KEEL
	Partly deciduous	
SHAPE	Persistent	Broad
		Medium
Tapering toward apex	COLOR	Narrow
Tapering both ways		
Uniform	Whitish	BEAK
Clubbed	Brownish	
	Yellow	Long
TIP ACUTE	Black	Medium
Tip blunt		Short
	SPIKELETS	Acute
BASE ABRUPT		Blunt
Base tapering	Spreading widely	
	Spreading	SHOULDER
SQUARE	Narrow	
Flattened with spikelets	Number of grains	Broad
Flattened across spikelets	1,2,3,4,5,6,7	Medium
		Narrow
STRAIGHT	BASAL HAIRS	Square
Slightly curved		Sloping
Sterile spikelets,	Long	Round
1,2,3,4,5,6,7	Medium	
	Wanting	AURICLE
COLOR	White	
	Brown	Sharp
Whitish		Medium
Yellow	OUTER GLUME	Blunt
Yellowish brown		Wanting
Rosy	Hairy or velvet	
Red	Partly hairy	
	Smooth	



APICAL GLUMES	COLOR	DROUGHT RESISTANCE
Keeled	Whitish	Good
Not keeled	Yellowish	Medium
Notched	Clear amber	Poor
Rounded	Dull amber	
Similiar	Clear red	YIELD
Dissimiliar	Dull red	
		Per plant _____
AURICLE NOTCH	BRUSH	Per acre _____
Deep	Large	
Medium	Small	
Shallow	Long	
Wanting	Short	
	CREASE	
<u>GRAIN</u>	Deep	
	Medium	
Very hard	Shallow	
Hard	Wide	
Medium	Medium	
Soft	Narrow	
Very soft		
	CROSS-SECTION	
SIZE	Very horny	
W't 100 av. seeds, grms.	Horny	
	Dull	
SHAPE	Starchy	
Long		
Medium		
Short		
	<u>MILLING QUALITIES</u>	
CURVED	First class	
Straight	Medium	
Pearshaped	Good	
	Poor	
THIN		
Medium		
Plump		
	<u>GENERAL CHARACTERISTICS</u>	
FLAT CHEEKED	Hardy	
Plump cheeked	Medium	
Angular cheeked	Delicate	
	EARLY	
Pointed at base	Medium	
Pointed at tip	Late	
Blunt at base	Days maturing	
Blunt at tip	Autumn planted	
	Spring planted	



## INDIANA SWAMP ( Galesburg Sta.)

## SEED

W't 100 average seeds 3.754 gr.

Size Width 10 average seeds 32.62 m.m.

Length " " " 70.5 m.m.

Shape -- Slightly pear-shaped

Color -- Yellowish amber

Composition      33 Starchy  
                     30 Mixed  
                     37 Horny

Hardness -- Medium hard

Cheek -- Flat

Base -- Pointed

Tip -- Blunt

Brush -- Medium hard  
               "        long

Crease -- Deep  
               Narrow

## YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

## HALF-GROWN PLANT

Color -- Medium green

Drooping

Scabrous

Leaf-blade Average length -- 21.08 c.m.  
               "        width    -- 1.35 c.m.

Glaucous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Medium to long

White

Auricle -- White with purple tips

Hairy -- Partly hairy





## MIXED WHEAT.

SEED

W't 100 average seeds - 3.24 gr.

Size	Width	10	"	"	-	31.35	m.m.
	Length	"	"	"	-	66.50	m.m.

Shape -- Straight sides

Color -- Yellowish amber

Composition	76%	starchy
	12%	mixed
	12%	horny

Hardness -- Medium

Cheek -- Full, plump

Base -- Pointed

Tip -- Blunt

Brush	Large
	Long

Crease	Medium deep
	" wide

YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Light green

Leaf blade	Average length	18.21	c.m.
	" width	1.29	c.m.

Ascending

Downy

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule	Short
	White

Auricle -- white with purple tips

Hairy -- Partly hairy



## RUPERT'S GIANT.

SEED

W'T 100 average grains 4.079 gr.  
 Size Width 10 " " 32.75 m.m.  
 Length " " " 68.25 m.m.  
 Shape -- Straight sides

Color -- Clear amber  
 40% Starchy

Composition 32% Mixed  
 28% Horny

Hardness -- Soft

Cheek -- Flat  
 Angular

Base -- Pointed

Tip -- Blunt

Brush -- Small  
 Short

Crease -- Medium deep  
 Wide

YOUNG STOOL

Form -- Erect

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
 Drooping

Average width 20.52 c.m.

Leaf Blade Average length 1.60 c.m.

Scalrous

Glossy

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Medium long

Auricle -- White and white with purple tips

Hairy -- Smooth





## TURKEY RED (Griswold Seed Co.)

SEED

W't 100 average seeds 2.89 gr.  
 Size Width 10 " " 29.7 m.m.  
 Length " " " 62.0 m.m.

Shape -- Pear-shaped

Color -- Dull amber

32% Starchy  
 Composition 20% Mixed  
 48% Horny

Hardness-- Hard

Cheek -- Full  
 Flat

Base -- Pointed.

Tip -- Blunt

Brush -- Large  
 Short

Crease -- Medium deep  
 " wide

YOUNG STOOL

Form -- Spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium grey green

Drooping

Average length 19.18 c.m.  
 Leaf blade " width 1.16 c.m.

Smooth

Downy

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Medium long  
 White and purple

Auricle -- White with purple tips

Hairy -- Smooth



## DAWSON'S GOLDEN CHAFF (Harvey Seed Co.)

SEED

Wt. 100 average seeds 3.30 gr.  
 Size Width 10 " " 34.35 m.m.  
 Length " " " 65.00 m.m.

Shape -- Pear-shaped

Color -- Very light yellowish

52% Starchy

Composition -- 28% Mixed

20% Horny

Hardness -- Soft

Plump  
 Cheek -- Full

Base -- Pointed

Tip -- Blunt

Small  
 Brush -- Short

Deep  
 Crease -- Medium wide

YOUNG STOOL

Form -- Partly spreading

Color -- Light green

HALF-GROWN PLANT

Color -- Medium green

Drooping

Average length 19.38 c.m.

Leaf blade -- Average width 1.47 c.m.

Smooth

Downy

Veins -- Not prominent

End of Blade -- Tapering

Sheath -- Green

Short  
 Ligule -- White and purple

Auricle -- Green and white with purple tips

Hairy -- Smooth



## FULTZO. MEDITERRANEAN (E. C. Detmer)

SEED

Wt. 100 average seeds 3.43 gr.  
 Size Width 10 " " 32.00 m.m.  
 Length " " " 63.3 m.m.

Shape -- Pear-shaped

Color -- yellowish amber

Composition -- 52% Starchy  
 40% Mixed  
 8% Horny

Hardness -- Soft

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Blunt

Brush -- Large  
 Medium long

Crease -- Deep  
 Medium Wide

YOUNG STOOL

Form -- Partly spreading

Color -- Light green

HALF-GROWN PLANT

Color -- Medium green

Drizzling  
 Average length 20. 21 c.m.  
 Leaf blade " width 1. 49 c.m.

Smooth  
 Glauous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- White  
 Short to medium

Auricle -- Green and white with purple tips

Hairy -- Smooth





## SILVER SHEAF LONGBERRY (Henderson Seed Co.)

SEED

	Wt.	100 average seeds	3.885 gr.
Size	Width	10 "	31.35 m.m.
	Length	" "	76.00 m.m.

Shape -- Straight sides

Color -- Yellowish

Composition 8% Mixed  
92% Starchy

Hardness -- Soft

Cheek -- Plump, Full

Base -- Pointed

Tip -- Semi-blunt

Brush -- Small  
LongCrease -- Deep  
WideYOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Light green

Drooping

Average length 21.44 c.m.

Leaf blade -- " width 1.685 "

Smooth

Glaucous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short to medium  
Green & white

Auricle -- White and green

Hairy -- Partly hairy



## TURKEY RED. (A. A. Berry ) \*

SEED

	Wt. 100 average seeds	2.544 gr.
Size	Width 10 " "	27.25 m.m.
	Length " " "	56.00 m.m.

Shape -- Straight sides

Color -- Clear amber

16% Starchy

Composition -- 60% Mixed

24% Horny

Hardness -- Hard

Cheek -- Plump  
Full

Base -- Pointed

Tip -- Bluntly pointed

Brush -- Large  
ShortCrease -- Medium deep  
NarrowYOUNG STOOL

Form -- Partly spreading

Color -- Light green

HALF-GROWN PLANT

Color

Leaf blade --	Average length
"	width

\* Winter killed.





## EARLY RED CHIEF.

SEED

	Wt.	100 average seeds	4.169 gr.
Size	Width	10 " "	33.00 m.m.
	Length	" " "	66.575 m.m.

Shape -- Straight sides

Color -- Dull amber

Composition -- 60% Mixed  
40% Horny

Hardness -- Medium

Cheek -- Flat  
Angular

Base -- Blunt

Tip -- Blunt

Brush -- Large  
LongCrease -- Medium deep  
" longYOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Dark green

Drooping

Average length 23.44 c.m.  
Leaf blade -- " width 1.68 c.m.

Scabrous

Downy

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- White  
ShortAuricle -- White  
White with purple tips

Hairy -- Smooth



## RURAL NEW YORKER NO. 57.

SEED

Wt. 100 average grains 3.865 gr.  
 Size -- Width 10 " " 32.40 m.m.  
           Length " " " 66.575 m.m.  
 Shape -- Straight sides  
 Color -- Dull amber  
           68% Starchy  
 Composition -- 12% Mixed  
                   20% Horny  
 Hardness -- Soft  
           Plump  
 Cheek -- Full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Short  
 Crease -- Deep  
           Medium wide

YOUNG STOOL

Form -- Partly spreading  
 Color -- Light green

HALF-GROWN PLANT

Color -- Light green  
           Erect and ascending  
           Average length 22.65 c.m.  
 Leaf blade -- " width 1.60 "  
           Scabrous  
           Glaucous  
 Veins -- prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium to short  
           White  
 Auricle -- White with purple tips  
 Hairy -- Smooth



## JONES LONGBERRY. (Henderson Seed Co.)

SEED

Wt. 100 average seeds 3.94 gr.  
 Size -- Width 10 " " 31.6 m.m.  
           Length " " " 69.5 m.m.  
 Shape -- Straight sides  
 Color -- Clear amber  
           8% Starchy  
 Composition -- 20% Mixed  
                 72% Dull horny  
 Hardness -- Medium hard  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
 Tip -- Bluntly pointed  
 Brush -- Large  
           Long  
 Crease -- Deep  
           Medium wide

YOUNG STOOL

Form -- Partly spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Medium to dark green  
           Drooping  
           Average length 18.25 c.m.  
 Leaf blade -- " width 1.78 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           Light green  
 Auricle -- White  
 Hairy -- Smooth





## TURKISH RED. (L. L. Olds )

SEED

Wt. 100 average seeds 3.026 gr.  
 Size -- Width 10 " " 29.05 m.m.  
       Length " " " 63.575 m.m.  
 Shape -- Straight sides  
  
 Color -- Dull amber  
 Composition -- 92% Starchy  
                   8% Mixed  
 Hardness -- Hard  
  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
  
 Tip -- Blunt  
  
 Brush -- Small  
           Short  
  
 Crease -- Medium deep  
           " wide

YOUNG STOOL

Form -- Spreading  
  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Light grey green  
           Partly drooping  
           Average length 19.54 c.m.  
 Leaf blade -- " width 1.21 c.m.  
           Scabrous  
           Glaucous  
 Veins -- Prominent  
  
 End of blade -- Tapering  
  
 Sheath -- Green  
  
 Ligule -- Medium long  
           White  
  
 Auricle -- White  
           White with purple tips  
  
 Hairy -- Smooth



## CLAWSONS LONGBERRY.

SEED

Wt. 100 average seeds 3.973 gr.  
 Size -- Width 10 " " 31.975 m.m.  
       Length " " " 75.375 m.m.  
 Shape -- Straight sides  
 Color -- Light yellowish  
           60% Starchy  
 Composition -- 32% Mixed  
               8% Horny  
 Hardness -- Very soft  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Medium long  
           Deep  
 Crease -- Medium wide

YOUNG STOOL

Form -- Partly spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
           Ascending  
           Average length 18.16 c.m.  
 Leaf Blade -- " width 1.52 c.m.  
           Smooth  
           Glaucous  
 Veins -- Prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Short  
           Light green  
 Auricle -- White with purple tips  
 Hairy -- Smooth



## GOLD COIN.

SEED

Wt. 100 average seeds 3.967 gr.  
 Size -- Width 10 " " 33.1 m.m.  
           Length " " " 69.3 m.m.  
 Shape -- Pear-shaped  
 Color -- Light yellowish  
           60% Starchy  
 Composition -- 24% Mixed  
                   16% Horny  
 Hardness -- Very soft  
           Plump  
 Cheek -- Full  
 Base -- Bluntly pointed  
 Tip -- Blunt  
           Small  
 Brush -- Short  
           Medium to shallow  
 Crease -- " " narrow

YOUNG STOOL

Form -- Partly spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
           Drooping  
           Average length 19.01 c.m.  
 Leaf blade -- " width 1.44 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of blade -- tapering  
 Sheath -- Green  
 Auricle -- Purple  
           White with purple tips  
 Ligule -- Short  
           Light green  
 Hairy -- Smooth





## PEDIGREE GIANT.

SEED

Size -- Wt. 100 average seeds 4.0425 gr.  
           Width 10       "       "       33.225 m.m.  
           Length "       "       "       65.55 m.m.

Shape -- Pear-shaped

Color -- Yellowish

Composition -- 76% Starchy  
                   16% Mixed  
                   8% Horny

Hardness -- Soft

Cheek -- Plump  
           Full

Base -- Pointed

Tip -- Bluntly Pointed

Brush -- Large  
           Short

Crease -- Deep  
           Medium to wide

YOUNG STOOL

Form -- Spreading

Color -- Light green

HALF-GROWN PLANT

Color -- Medium green  
           Erect and ascending  
           Average length 16.71 c.m.

Leaf blade -- "       width 1.51 c.m.

Smooth

Downy and glaucous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule Short to medium  
           White

Auricle -- White

Hairy - Partly hairy



## TURKISH RED. ( B. A. Lockwood)

SEED

Wt. 100 average seeds 2.841 gr.  
 Size Width 10 " " 28.75 m.m.  
 Length " " " 62.05 m.m.  
 Shape -- Straight sides  
 Color -- Dull amber  
           68% Starchy  
 Composition -- 24% Mixed  
               8% Horny  
 Hardness -- Hard  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Short  
 Crease -- Medium to shallow  
           " " wide

YOUNG STOOL

Form -- Spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Medium grey green  
           Ascending  
           Average length 16.64 c.m.  
 Leaf blade -- " width .99 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Short  
           White  
 Auricle -- White  
           White with purple tips  
 Hairy -- Smooth



## DIAMOND GRIT

SEED

Wt. 100 average seeds 3.2965 gr.  
 Size -- Width 10 " " 31.05 m.m.  
       Length " " " 58.75 m.m.  
 Shape -- Pear-shaped  
 Color -- Dull amber  
 Composition -- 71% Starchy  
               29% Horny and mixed  
 Hardness -- Soft  
 Cheek -- Full  
           Plump  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Short  
 Crease -- Medium to shallow  
           " " narrow

YOUNG STOOL

Form -- Partly spreading  
 Color -- Light green

HALF-GROWN PLANT

Color -- Light to medium green  
           Drooping  
           Average length 17.15 c.m.  
 Leaf blade " width 1.43 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule Medium long  
       White  
 Auricle -- White  
 Hairy -- Smooth





✓  
RURAL NEW YORK, NO. 6

SEED

Wt. 100 average seeds 4.425 gr.  
 Size -- Width 10 " " 34.45 m.m.  
           Length " " 70.85 m.m.  
 Shape -- Pera-shaped  
  
 Color -- Dull amber  
           8% Starchy  
 Composition -- 72% Mixed  
                 20% Dull horny  
 Hardness -- Medium hard  
  
 Cheek -- Plump  
           Full  
 Base -- Bluntly pointed  
  
 Tip -- Blunt  
  
 Brush -- Large  
           Long  
  
 Crease -- Medium to deep  
           " " wide

YOUNG STOOL

Form -- Erect  
  
 Color -- Light green

HALF-GROWN PLANT

Color -- Medium green  
           Drooping  
           Average length 19.96 c.m.  
 Leaf blade -- " width 1,465 c.m.  
                 Scabrous  
                 Glaucous  
 Veins -- Not prominent  
  
 End of blade -- Tapering  
  
 Sheath -- Green  
  
 Ligule -- Short  
           White  
 Auricle -- White with purple tips  
  
 Hairy -- Smooth



## MALAKOFF

SEED

Wt. 100 average seeds 3.19 gr.  
 Size -- Width 10 " " 30.25 m.m.  
       Length " " " 65.25 m.m.  
 Shape -- Straight sides  
 Color -- Dull amber  
 Composition -- 50% Starchy  
               50% Horny  
 Hardness -- Medium  
 Cheek -- Full  
           Plump  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Short  
           Large  
 Crease -- Medium to deep  
               " wide

YOUNG STOOL

Form -- Spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Light to medium grey green  
           Ascending  
           Average length 17.96 c.m.  
 Leaf blade -- " Width 1.02 c.m.  
               Smooth  
               Downy  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           White  
 Auricle -- Purple  
           White with purple tips  
 Hairy -- Smooth



## TURKEY RED (Urbana Station )

SEED

Wt. 100 average seeds 3.1599 gr.  
 Size -- Width 10 " " 29.85 c.m.  
           Length " " " 64.6 c.m.  
 Shape -- Varying Straight  
           Pear-shaped  
 Color -- Dull amber  
 Composition -- 60% Starchy  
                   40% Mixed  
 Hardness -- Medium  
 Cheek -- Full  
           Plump  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Short  
 Crease -- Medium to shallow  
           Medium wide

YOUNG STOOL

Form -- Spreading  
 Color -- Medium Green

HALF-GROWN PLANT

Color -- Medium to dark grey green  
           Ascending  
           Average length 18.74 c.m.  
 Leaf Blade -- Average width 1.64 "  
                   Smooth  
                   Glaucous  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           White  
 Auricle -- White with purple tips  
 Hairy -- Smooth





## DAWSON'S GOLDEN CHAFF (Urbana Station)

Seed

Wt. 100 average seeds 3.364 gr.  
 Size -- Width 10 " " 32.425 m.m.  
           Length " " " 65.00 m.m.  
 Shape -- Pear-shaped  
 Color -- Light Yellowish  
 Composition -- 96% Starchy  
                   4% Mixed  
 Hardness -- Very soft  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Medium long  
           Large  
 Crease -- Medium to deep  
           " " wide

YOUNG STOOL

Form -- Partly spreading  
 Color -- Light green

HALF-GROWN PLANT

Color -- Medium green  
           Drooping  
           Average length 17.68 c.m.  
 Leaf blade -- " width 1.42 c.m.  
           Smooth  
           Glaucous  
 Veins -- not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Short  
           White  
 Auricle -- White with purple tips  
 Hairy -- Smooth



NO. 11603

SEED

Wt. 100 average seeds 2.861 gr.  
 Size -- Width 10 " " 27.625 m.m.  
       Length " " " 63.475 m.m.  
 Shape -- Straight sides  
 Color -- Dull amber( very dark and greyish)  
 Composition -- 17% Mixed  
                   85% Very horny  
 Hardness -- hard  
 Cheek -- Full  
           Flat  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Large  
           Medium long  
 Crease -- Medium deep  
           Narrow

YOUNG STOOL

Form -- Spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Light grey green  
           Drooping  
           Average length 17.54 c.m.  
 Leaf blade -- " width 1.17 c.m.  
               Downy  
               Smooth  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           White  
 Auricle -- Purple  
           White with purple tips  
 Hairy -- Partly hairy



## 1. HUNGARIAN

SEED

Wt. 100 average seeds 3.646 gr.  
 Size -- Width 10 " " 31.675 m.m.  
 Length " " " 66.5 m.m.

Shape -- Straight sides

Color -- Dull amber

Composition -- Starchy 45%  
 Dull and horny 55%

Hardness-- Soft

Cheek -- Full  
 Plump

Base -- Pointed

Tip -- Blunt

Brush -- Medium large  
 " long

Crease --Medium to deep  
 " " wide

YOUNG STOOL

Form -- Spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Light grey green

Drooping

Average length 18.95 c.m.

Leaf blade -- " width 1.25 c.m.

Scabrous

Glaucous

Veins -- Not prominent

End of Blade -- Tapering

Sheath -- Green

Ligule -- Medium to long  
 Light purple

Auricle -- Purple  
 White with purple tips

Hairy -- Smooth



## RUDY

SEED

Wt. 100 average seeds 4.285 gr.  
 Size -- Width 10 " " 32.675 m.m.  
       Length " " " 75.375 m.m.  
 Shape -- Pear-shaped  
 Color-- Dull-reddish amber  
 Composition -- 62% Starchy  
               38% Mixed  
 Hardness -- Soft  
 Cheek -- Full  
       Plump  
 Base -- Pointed  
 Tip -- Bluntly pointed  
 Brush -- Large  
       Long  
 Crease -- Medium deep  
           " to wide

YOUNG STOOL

Form -- Spreading  
 Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
           Drooping  
           Average length 20.36 c.m.  
 Leaf blade -- " width 1.39 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           White  
 Auricle -- Purple  
           White with purple tips  
 Hairy -- Smooth





## WHEEDLING.

SEED

	Wt.	100 average seeds	3.4575 gr.
Size --	Width	10 " "	32.2 m.m.
	Length	" " "	68.9 " "

Shape -- Pear - shaped

Color -- Dull yellowish amber

Composition -- 92% Starchy  
8% Horny

Hardness -- Soft

Cheek -- Full  
Plump

Base -- Pointed

Tip -- Bluntly Pointed

Brush -- Small  
ShortCrease -- Deep  
Medium wideYOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANTColor -- Dark green  
Average length 16.24 c.m.  
" width 1.41 " "Leaf blade -- Ascending  
Smooth  
Not glaucous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short to medium  
White

Auricle -- White

Hairy -- Partly hairy



## HARVEST KING

SEED

Wt. 100 seeds average 3.82 gr.  
 Size -- Width 10 average seeds 32.05 m.m.  
           Length " " " 68.7 m.m.  
 Shape -- Pear-shaped  
 Color -- Dull reddish amber  
 Composition -- 84% Starchy  
                   16% Horny  
 Hardness-- Medium hard  
 Cheek -- Full  
           Plump  
 Base -- Pointed  
 Tip -- Bluntly pointed  
 Brush -- Small  
           Long  
 Crease -- Medium wide  
           Deep

YOUNG STOOL

Form -- Erect  
 Color -- Light green

HALF-GROWN PLANT

Color -- Light to medium green  
           Partly drooping  
           Average length 17.55 c.m.  
 Leaf blade -- " width 1.58 c.m.  
           Smooth  
           Glaucous  
 Veins -- Not prominent  
 End of leaf -- Tapering  
 Sheath -- Green  
 Ligule -- Light green  
           Medium to long  
 Auricle -- White with purple tips  
 Hairy -- Partly hairy



## BULGARIAN.

SEED

Wt. 100 average seeds 2.95 gr.  
 Size -- Width 10 " " 29.05 m.m.  
           Length " " " 60.425 m.m.  
 Shape -- Straight sides  
  
 Color -- Dull yellowish amber  
           68% Starchy  
 Composition -- 8% Mixed  
                 24% Very horny  
 Hardness -- Hard  
  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
  
 Tip -- Blunt  
  
 Brush -- Large  
           Medium long  
  
 Crease -- Medium deep  
           Narrow

YOUNG STOOL

Form -- Spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
           Ascending and erect  
           Average length 1.74 c.m.  
 Leaf blade -- " width 1.1 c.m.  
                 Smooth  
                 Glaucous  
 Veins -- Prominent  
  
 End of blade -- Tapering  
  
 Sheath -- Green  
  
 Ligule -- Short to medium  
           Light purple  
  
 White with purple tips  
  
 Hairy -- Smooth





## MAMMOTH AMBER GIANT.

SEED

Wt. 100 average seeds 4.64 gr.  
 Size -- Width 10 " " 34.275 m.m.  
 Length " " " 68.45 " "

Shape Pear-shaped

Color -- Light yellow to clear amber

12% Starchy

Composition -- 38% Mixed

60% Horny

Hardness -- Medium hard

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Bluntly pointed

Brush -- Small  
 Short

Crease -- Deep  
 Medium wide

YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Dark Green

Drooping

Average length 17.40 c.m.

Leaf blade -- " width 1.81 " "

Smooth

Not glaucous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short  
 White

Auricle -- White

Hairy -- Partly hairy



## FULTZO MEDITERRANEAN ( L. B. Kuney)

SEED

Wt. 100 average seeds 3.44 gr.  
 Size -- Width 10 " " 32.225 m.m.  
       Length " " " 64.36 m.m.  
 Shape -- Prar-shaped  
 Color -- Dull yellowish  
           40% Starchy  
 Composition -- 40% Mixed  
               20% Horny  
 Hardness -- Soft  
 Cheek -- Plump  
           Full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Medium large  
           Short to medium long  
 Crease -- Medium to deep  
           Medium wide

YOUNG STOOL

Form -- Partly spreading  
 Color -- light green

HALF-GROWN PLANT

Color -- Medium green  
           Drooping  
           Average length 20.55 c.m.  
 Leaf blade -- " width 1.52 c.m.  
               Smooth  
               Downy  
 Veins -- Prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Short to medium  
           Whitish purple  
 Auricle -- White with purple tips  
 Hairy -- Smooth



## CORN WHEAT \*

SEED

	Wt. 100 average seeds	2.96 gr.
Size -- Width	10 " "	27.05 m.m.
	Length " " "	67.45 " "

Shape -- Straight sides

Color -- Clear amber

Composition -- 8% Mixed  
92% Very horny

Hardness -- Very hard

Cheek -- Plump  
Slender

Base -- Pointed

Tip -- Blunt

Brush -- Small  
ShortCrease -- Medium deep  
NarrowYOUNG STOOL

Form -- Erect

Color -- Light green

HALF-GROWN PLANT

Color --

Leaf blade --

Veins --

End of blade

Sheath --

Ligules --

Auricles --

Hairy

\* Winter killed



## TURKEY RED. ( Iowa Seed Co.)

SEED

Wt. 100 average seeds 3.008 gr.  
 Size -- Width 10 " " 28.825 m.m.  
 Length " " " 61.4 " "

Shape -- Straight sides

Color -- Dark yellowish amber

Composition -- 44% Starchy  
 16% Mixed  
 40% Horny

Hardness -- Hard

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Blunt

Brush -- Large  
 Medium long

Crease -- Shallow  
 Narrow

YOUNG STOOL

Form -- Spreading

Color -- Purplish

HALF-GROWN PLANT

Color -- Dark grey green  
 Ascending  
 Average length 13.39 c.m.  
 Leaf blade -- " width .98 " "  
 Smooth  
 Glaucous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short to medium  
 White

Auricle -- White with purplish tips

Hairy -- Partly hairy





## SILVER SHEAF LONGBERRY ( Jones, N. Y.)

SEED

WT. 100 average seeds 4.90 gr.  
 Size -- Width 10 " " 32.178 m.m.  
 Length " " " 77.95 " "

Shape -- Straight sides

Color -- Dull amber

Composition -- 36% Starchy  
 48% Mixed  
 16% Horny

Hardness -- Medium hard

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Blunt

Brush -- Medium large  
 Short

Crease -- Medium deep  
 " wide

YOUNG STOOL

Form -- Erect

Color -- Medium green

HALF-GROWN PLANT

Color--- Medium green  
 Drooping  
 Average length 18:04 c.m.  
 Leaf blade -- " width 1.54 " "  
 Smooth  
 Not glaucous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Medium long  
 Light green

Auricle -- White

Hairy -- Partly hairy



## JONES LONGBERRY. (Homes Seed Co.)

SEED

Wt. 100 average seeds 4.3365 gr.  
 Size -- Width 10 " " 32.4 m.m.  
 Length " " " 73.125 m.m.

Shape -- Pear-shaped

Color -- Dull amber

Composition -- 24% Starchy  
 28% Mixed  
 48% Horny

Hardness -- Medium hard

Plump  
 Cheek -- Full

Base -- Pointed

Tip -- Blunt

Brush -- Medium large  
 Long

Crease -- Medium deep  
 " wide

YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green  
 Drooping  
 Average length 17.78 c.m.  
 Leaf blade -- " width 1.85 "  
 Smooth  
 Not glaucous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Medium long  
 White

Auricle -- White with purple tips

Hairy -- Smooth



## FULTZO MEDITERRANEAN. (Homes Seed Co.)

SEED

Wt. 100 average seeds 3.28 gr.  
 Size -- Width 10 " " 30.4 m.m.  
 Length " " " 64.725 m.m.

Shape-- Pear-shaped

Color -- Dull yellowish amber

8% Starchy  
 Composition --56% Mixed  
 36% Horny

Hardness -- Medium

Plump  
 Cheek -- Angular

Base -- Pointed

Tip -- Blunt

Brush -- Large  
 Long

Deep  
 Crease -- Medium to wide

YOUNG STOOL

Form -- Partly spreading

Color -- Light green

HALF GROWN PLANT

Color -- Medium green  
 Partly drooping  
 Average length 19.30 c.m.  
 Leaf blade -- " width 1.376 "  
 Smooth  
 Not Glauous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Short  
 Ligule -- White

Auricle -- White

Hairy -- Partly hairy





## DEFIANCE WINTER WHEAT.

SEED

Size -- Wt. 100 average seeds 2.93 gr.  
           Width 10       "       "       28.35 m.m.  
           Length "       "       "       60.75 " "

Shape -- Straight sides

Color -- Amber

                          28% Starchy  
 Composition -- 36% Mixed  
                           36% Very Horny

Hardness -- Hard

Cheek -- Plump  
           Full

Base -- Pointed

Tip -- Blunt

Brush -- Large  
           Short

Crease -- Shallow  
           Narrow

YOUNG STOOL

Form -- Spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium grey green  
                           Ascending  
                           Average length 19.36 c.m.  
 Leaf blade -- "       width 1.025 "  
                           Smooth  
                           Glaucous

End of blade -- Tapering

Veins -- Not prominent

Sheath -- Green

Ligule -- Medium long  
           White

Auricle -- White with purple tips

Hairy -- Partly hairy



## PADI.

SEED

	Wt.	100 average seeds	2.695 gr.
Size --	Width	10 " "	28.8 m.m.
	Length	" "	61.825 "

Shape -- Pear-shaped

Color -- Yellowish

80% Starchy

Composition-- 16% Mixed

4% Horny

Hardness -- Very soft

Cheek -- Plump

Full

Base -- Pointed

Tip -- Blunt

Brush -- Large

Long

Crease -- Medium to deep

" wide

YOUNG STOOL

Form -- Spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium yellowish green

Drooping

Average length 19.31 c.m.

Leaf blade -- " width 1.27 " "

Scabrous

Not Glauous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short

White

Auricle -- Purple

White with purple tips

Hairy -- Smooth



## NEW WHEAT

SEED

Wt. 100 average seeds  
 Size -- Width 10 " "  
 Length " " "

Shape

Color

Composition

Hardness

Cheek

Base

Tip

Brush

Crease

YOUNG STOOL

Form -- Partly spreading

Color -- Dark green

HALF-GROWN PLANT

Color -- Medium green

Ascending

Average length 19.58 c.m.

Leaf blade -- " width 1.63 " "

Scabrous

Not glaucous

Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short

White and purple

Auricle -- White

Hairy -- Smooth



## K. B. No. 2.

SEED

	Wt.	100 average seeds	3.3575 gr.
Size --	Width	10 " "	32. m.m.
	Length	" " "	66.9 "

Shape -- Pear-shaped

Color -- Light yellowish

Composition -- 92% Starchy  
8% Mixed

Hardness -- Very soft

Cheek -- Plump  
Angular

Base -- Pointed

Tip -- Blunt

Brush -- Large  
LongCrease -- Deep  
Medium to wideYOUNG STOOL

Form -- Erect

Medium green -- Color

HALF-GROWN PLANTColor -- Medium green  
Ascending and erect  
Average length 17.51 c.m.  
Leaf blade -- " width 1.52 " "Scabrous  
Glaucous

Veins -- Prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short to medium  
White with purple fringe

Auricle -- White with purple tips

Hairy -- Partly hairy





## BELGOLINA.

SEED

Wt. 100 average seeds 3.33 gr.  
 Size -- Width 10 " " 30.05 m.m.  
           Length " " " 63.35 "  
 Shape -- Straight sides  
           20% Starchy  
 Composition -- 32% Mixed  
                 48% Horny  
 Hardness -- Hard  
 Cheek -- Plump  
           Medium full  
 Base -- Pointed  
 Tip -- Blunt  
 Brush -- Medium large  
           Short  
 Crease -- Medium Deep  
           Narrow

YOUNG STOOL

Form -- Spreading  
 Color -- Grey green

HALE-GROWN PLANT

Color -- Medium green  
           Erect  
           Average length 16.78 c.m.  
 Leaf blade -- " width 1.17 "  
           Scabrous  
           Glaucous  
 Veins -- Prominent  
 End of blade -- Tapering  
 Sheath -- Green  
 Ligule -- Medium long  
           White  
 Auricle -- Purple  
           White with purple tips  
 Hairy -- Smooth



## INDIANA SWAMP (Urbana Station)

SEED

Wt. 100 average seeds 3.98 gr.  
 Size -- Width 10 " " 30.95 m.m.  
 Length " " " 70. " "

Shape -- Slightly pear-shaped

Color -- Dull yellowish amber

Composition 32% Starchy  
 28% Mixed  
 40% Horny

End of blade -- Tapering

Hardness -- Soft

Sheath -- Green

Ch eek -- Plump  
 Full

Ligule -- Short  
 White

Base -- Pointed

Auricle -- White with purple tips  
 Purple

Tip -- Blunt

Hairy -- Smooth

Brush -- Small  
 Medium long

Crease -- Medium deep  
 " wide

YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium green

Ascending  
 Average length 19.19 c.m.  
 Leaf blade -- " width 1.48 " "  
 Smooth  
 Not glaucous

Veins -- Prominent



## RED HUSSAR

SEED

Wt. 100 average seeds 3.745 gr.  
 Size -- Width 10 " " 31.9 m.m.  
 Length " " " 69.925 "

Shape -- Slightly pear-shaped

Color -- Yellowish

Composition -- 96% Starchy  
 4% Mixed

Hardness -- Soft

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Blunt

Brush -- Medium large  
 " long

Crease -- Deep  
 Medium to wide

YOUNG STOOL

Form -- Partly spreading

Color -- Medium green

HALF-GROWN PLANT

Color -- Medium to dark green

Drooping

Average width 1.53 c.m.  
 Leaf blade -- " length 20.91 " "

Smooth

Glaucous

Veins -- Prominent

End of Blade -- Tapering

Sheath -- Green

Short  
 Ligule -- White and purple

Auricle -- White with purple tips

Hairy -- Partly hairy





## PESTERBODEN.

SEED

	Wt.	100 average seeds	3.525 gr.
Size --	Width	10 " "	31.8 m.m.
	Length	" " "	63.75 "

Shape -- Straight sides

Color -- Dull yellowish amber

60% Starchy

Composition -- 20% Mixed

20% Horny

Hardness -- Medium Hard

Cheek -- Plump

Base -- Full

Base -- Pointed

Tip -- Blunt

Brush -- Large

Medium long

Crease -- Medium to deep

Medium wide

YOUNG STOOL

Form -- Spreading

Color -- Light green

HALF-GROWN PLANT

Color -- Medium green

Erect

Average width 1.23 c.m.

Leaf blade -- " length 19.38 "

Scabrous

Glaucous

Veins -- Prominent

End of Blade -- Tapering

Sheath -- Green

Ligule -- Medium to long

White

Auricle -- White with purple tips

Hairy -- Smooth



## MEALY WHEAT

SEED

Wt. 100 average seeds 3.03 gr.  
 Size -- Width 10 " " 29.975 m.m.  
 Length " " " 61.625 m.m.

Shape -- Pear shaped

Color -- Yellowish

Composition -- 72% Starch  
 20% Mixed  
 8% Horny

Hardness -- Medium hard

Cheek -- Plump  
 Full

Base -- Pointed

Tip -- Bluntly pointed

Brush -- Medium large  
 Long

Crease -- Medium deep  
 " wide

YOUNG STOOL

Form -- Partly spreading

Color -- Dark green

HALF-GROWN PLANT

Color -- Dark green

Ascending  
 Average length 17.98 c.m.  
 Leaf blade -- " width 1.28 " "

Smooth  
 Glaucous  
 Veins -- Not prominent

End of blade -- Tapering

Sheath -- Green

Ligule -- Short  
 White

Auricle -- White with purple tips

Hairy -- Partly hairy



From the foregoing classification it will be easy to compare the corresponding characteristics of the different varieties and note their similarity or dissimilarity. The result will indicate whether any two varieties will so resemble each other as to be known under one name or whether two samples of the same variety differ so widely that they should be classed as different varieties.

In comparing the varieties those of which two or more samples of the same variety were obtained from different sources will be considered first, and of these the one having the greatest number of samples is Turkey Red.

Turkey Red. (Pages 14, 18, 22, 26, 30, 41)

In general characteristics the samples all corresponded to each other with one or two exceptions. They were all fairly true to type, the greatest difference being in the weights of the extremes of the different samples which was .615 gr. per 100 grains. The second greatest was in texture, which could be accounted for by the difference in locality i.e. the softer variety was grown in a lower latitude than the others. All the varieties except one corresponded in general shape. This one was the lightest and seemed to differ most generally. It differed in color of grain, shape of grain, shape of tip, and color and form of the young stool. It also failed to pass the winter which was not very severe, which fact alone would indicate that it was not true to the name, though the few surviving stools possessed the delicate stem and fine leaf peculiar to this variety. These characteristics, however, were possessed by a few other varieties. From the closeness with which the other samples corresponded we must conclude that they were all





true to the Turkey Red type and should be so classified.

#### Dawson's Golden Chaff.

The two samples of this corresponded as closely as did any two of the Turkey Red. They differed only .06 gr. per 100 grains and less than 2 m.m. in length of two measurements of 100 grains each. The greatest difference was in composition and in length and size of the brush. Color and texture, however, were alike and were such as to distinguish these samples from every other variety in the classification.

#### Silver Sheaf Longberry.

The two samples of this variety did not correspond so closely. (See pages 17, and 42 ) Both were long grained wheats, but the variety coming from Jones, Leroy, New York, was much larger; 100 grains outweighed a similar number from Henderson, New York City, by 1.015 grams. The general shape is the same, yet near the tip the sample obtained from the latter address begins to taper, while that from the former retains its width. There is a difference in degree of hardness; there is little comparison in the brush; the crease possesses different degrees of depth and width and the forms of the young stools are not comparable, one growing erect and the other partly spreading. In fact the only characteristics in which they more nearly resemble are length of grain, shape of grain, and color of young stool, and we are led to the conclusion that so far as seed and young stool are concerned if one variety is Silver Sheaf Longberry, the other is not.

Jones' Longberry. (Pages 21 and 43)





These samples give a better comparison though not as good as that between the samples of Dawson's Golden Chaff or Turkey Reds. They differ .3965 gr. per 100 grains and the sample from Homes was pear-shaped though only slightly so. The sample from Henderson was clear amber in color while the other was somewhat duller. They differed slightly in percentage composition, but so far as the seed and young stool are concerned they correspond in all other apparent characteristics and should be included under one variety name.

Fultzo Mediterranean. ( Pages 16, 39, 44)

There were three samples of this variety and they compared more closely <sup>or</sup>thn did those of the one just discussed. They differed but slightly in color as may be seen from the classification sheets. The percentage composition was fairly uniform and the six varied .16 gr. only. One sample varied slightly in texture and shape of cheek, but the general comparison was very good, and all might be classified under the scale of either one without losing the variety distinction.

Indiana Swamp. (Pages 11, 50)

Two samples of this variety were compared and were found to correspond more closely than those of any other variety. There was a slight difference in color texture, and dimensions of brush, and also in width and depth of crease, though none of these were greater than we should expect of two samples raised in different localities for a series of years, and unless later developments bring out differences not now seen both samples should remain as one variety.



The remaining varieties, unless their characteristics are so identical as to two or more together or with those just analyzed, will be regarded as a permanent variety so far as this work is concerned.

Taking them in their order we have first:

Mixed Wheat. (Page 12 )

This wheat was obtained under no variety name. It is a small wheat weighing in <sup>nu</sup>round numbers 2.25 gr. per 100 grains, and may be classed among those weighing 3.4 gr. and less per 100 grains. Of the varieties in this class to which it bears the nearest resemblance, the Mealy Wheat is the only one near enough to be considered. The two wheats resemble each other in color of seed and weight of grain. They differ, however, in shape of grain, length of grain, and color of young stool. The color of the grain also is not identical and the weights cannot offset the other differences. So we must therefore conclude that it is different from all other varieties here classified.

Rupert's Giant. (Page 13)

This variety has two distinguishing characteristics,- angular cheeks and erect stool,- which separate it at once from all except four other varieties. These are Fultzo Mediterranean, Silver Sheaf Longberry, Early Red Chief and Harvest King. Its first mentioned possible relative is at once separated by the difference in size i.e. weight and in color of grain. The growth of the young stool in the Silver Sheaf Longberry is erect but the cheek of the grain is round and the general minor characteristics differ sufficiently to separate the varieties. Harvest King differs in shape of grain





and fullness of cheek which is sufficient to distinguish it. Early Red Chief has angular cheeks, but differs as to color of grain, shape of grain, and form of young stool, so we must consider Rupert's Giant as a distinct variety.

#### Early Red Chief. (Page 19)

The distinguishing characteristic of this variety is in the grain. The cheek is flat and angular, a shape that is possessed by no other variety in the classification, and is sufficient to identify it. In weight it corresponds to some six other varieties, but none possess the flat angular cheek and all differ in color of grain, one excepted, which differs in color of young stool. So in this classification the variety remains distinct.

#### Rural New Yorker, No. 57. (Page 20)

The varieties with which this wheat is more likely to correspond are those weighing 38 -- 42 gr. per 100 grains, and which measure 64 -- 68 m.m. in length per 10 grains. It does not correspond to those previously discussed for reasons there given, and of varieties discussed in duplicates or more, the Indiana Swamp is the only one falling within the weight limit. This variety, however, differs quite distinctly in both color and shape of grain and appearance of young stool, so we must give this wheat a place as a variety in the classification.

#### Clawson's Longberry. (Page 23 )

The weight of this wheat would place it in the class with the one just discussed, but when we consider the length of grains, 10 grains measuring 75.375 m.m. , we cannot place it in a class with





the previous one which measures 66 m.m. and more. Its length places it in a class with two other varieties -- Jones' Longberry and Silver Sheaf Longberry. Jones' Longberry, however, differs in shape of grain and texture aside from variation in size of brush and depth of crease which is sufficient to separate the two. Silver Sheaf Longberry, on the other hand, is quite its equal in length. We find that one sample of the latter is almost a gram per 100 seeds heavier, however, which is much more difference than should exist between duplicates of the same variety. Other differences also help to separate the two wheats. The other sample of Silver Sheaf Longberry corresponds much more closely; both have straight sides, both appear to have predominating percentage of starch, there is a difference of only one degree in texture, cheeks correspond, there is a difference of two degrees in size of brush and only one in width of crease. When we consider this classification only we find that the resemblance between these two wheats is as close as exists between samples of Indiana Swamp or Turkey Red.

When we consider that the two samples of Silver Sheaf Longberry are so radically different that they cannot be classed together we may conclude that if we give to the larger grained variety the above mentioned name, it is possible to classify the other with the sample to which it more nearly and in fact quite closely corresponds i.e. Clawson's Longberry.

Harvest King. (Page 36 )

Weight places this variety with those previously discussed as individuals but it has two distinguishing characteristics which limit its possible close relationship to four varieties i.e. the



color of grain and the form and color of the young stool. The young stool of the Silver Sheaf Longberry corresponds, but the size of the grain is too large for any further comparison. Rupert's Giant corresponds in weight and in the growth of the young stool but differs too radically in shape of grain, color, composition, and color of young stool. Corn Wheat corresponds quite favorably in growth of young stool, but many other differences distinguish the seeds aside from the fact that the latter variety failed to withstand the comparatively mild winter, which indicates that it is a spring variety. For want of sufficient evidence to the contrary therefore we must allow this wheat to remain a distinct variety.

#### Gold Coin (Page 24)

The weight of this variety places it in the same class with Clawson's Longberry. It also compares very well in color, texture and composition, but is different in the shape of the kernels which are not so long but more plump, the grain being decidedly pear-shaped. The brush and crease also differ quite widely. The variety does not correspond with those described singly for reasons there given, and of the others only the Indiana Swamp compares closely. Between these two there is a difference in color of grain, texture and composition, and also in length of brush and in width and depth of crease. So this wheat must so far be considered a variety.

#### Pedigree Giant. (Page 25)

The one variety to which this wheat most nearly corresponds is Gold Coin. The two compare favorable in weight, color of grain,



texture and starchy composition. A slight difference is seen when we consider the extremities and this is continued through the brush and crease and when we consider the young stool not much similarity can be found, one being partly spreading and medium green and the other spreading and light green. So while they have much in common they also have a sufficient number of points to separate them as varieties and we should consider Pedigree Giant as such.

#### Diamond Grit. (Page 27)

This variety falls into the class of small wheats. Its texture at once separates it from the Turkey Reds and its color from the Dawson's Golden Chaff. The variety which it more nearly resembles is Fultzo Mediterranean. It compares favorably as to color texture and shape of grain. The starchy content of the Diamond Grit appears higher and there is a difference in length and size of brush and depth and width of crease, Diamond Grit being larger and shorter in the first instance, and shallower and narrower in the second. The greatest difference, however, is in the relative length to width of grain. In proportion to its width Diamond Grit is the shortest-grained variety in the classification, and has a very chubby appearance which is in itself a sufficient distinction to classify it as a variety.

#### Rural New Yorker No. 6. (Page 28)

The sample obtained was one of the heavier ones, it being third in classification. As regards weight the size of grain would indicate that it should be classified in one of two varieties only -- Rudy or Mammoth Amber Giant. It differs from the





first, however, in general shape of grain, in form and color, and also texture. The Rudy is longer and narrower, is softer, and differs in form and color of the young stool. The same general differences hold true between Rural New Yorker No. 6 and its other possible relative, as the latter is shorter and more chubby; there is an apparent difference in the composition of the two and also in the measurements of brush and crease. The young stools also differ in form and color. So this wheat must here and at present be considered a distinct variety.

Malakoff. (Page 29.)

This wheat may be classed among the smaller varieties. The weight per 100 grains, also the measurements, would indicate that it belongs with the Turkey Reds, as would also the general shape of the grain. There is a slight variation in the contour of the sides of the grain, also in composition and in depth of crease, but it corresponds almost identically with the sample of Turkey Red from Urbana, both as to grain and young stool. Unless therefore some distinct variation occurs in the growth of the young stool or in mature plant we will have to regard the sample as possessing sufficient resemblance to the Turkey Reds to be classed with this variety.

No. 11603 (Page 32)

This wheat is also small grained. It compares in weight with several varieties, but is a slender grained variety. There is one variety of Turkey Red to which it is somewhat similar in color yet not at all identical. The Turkey Red has a yellowish cast and No. 11603 a greyish or dead cast. This is a small but distinct





difference which is more evident when the two samples are compared in bulk. The most distinct difference, however, is in the relative length to width of grain which is sufficient to separate them into varieties. The cheek of No. 11603 is also flat while the starchy composition appears much lower, showing another departure. So we find that it corresponds to no other variety classified and should be here classified as a variety.

#### Hungarian. (Page 33)

A sample of this wheat corresponded with but few other varieties in the classification, both as to weight and as to color. This last characteristic is not at all fixed and suggests that there is a possibility of its being a mixed variety. The color varies from a dark or dull grey amber to a yellowish and clear amber and is in the individual grains. It cannot be grouped with varieties previously classified singly for reasons there given. It differs from those classified in groups quite distinctly in color, texture and size. Of the remaining samples Pesterboden and K. B. No. 2 and Wheedling are of nearly the same weight per 100 grains. These, however, differ very radically in almost every other characteristic so far as seed and young stool are concerned and we must accept the wheat as a variety.

#### Rudy. (Page 34)

This sample by reason of its weight may be classed with the medium or large wheats. The shape of the grain would indicate that it was related to the lighter variety of Silver Sheaf Longberry, but its color and texture are different and it is peculiar of this wheat that it is large grained and possesses a spreading



stool. This is true of one other variety, but the two differ in shape, color and measurement of grain so we must accept this sample as a variety in this classification.

#### Wheedling. (Page 35)

The weight of this variety per 100 grains places it in a group with those weighing 30 -- 36 gr. while its texture separates it from all those grading medium hard and above, it being a soft variety. The Fultzo Mediterraneans are the only samples classified in duplicates to which it bears a close resemblance and here there is enough difference, especially in the length of grain, general shape, dimensions of brush and color of young stool, to warrant a distinction. The variety not yet classified to which it bears the closest resemblance is K. B. No. 2. Those two are quite similar in most characteristics and dissimilar in some, both with regard to grain and young stool. They compare favorably in weight, measurement of grain and in general shape. They differ in color of grain, but are the same in composition. Both are soft with K. B. No. 2 the softer of the two. The dimensions of brush are opposite though depth and width of crease are the same; the young stool of K. B. No. 2 is erect while that of Wheedling is partly spreading. They differ in a few characteristics, but have so much in common that unless more differences are shown in later developments i.e. young stool and mature plant it is doubtful if there is enough difference to distinguish them as varieties.

#### Bulgarian. (Page 37)

The weight per 100 grains of this wheat places it among the



lighter varieties. It bears a close resemblance to the Turkey Reds and also the Mealy Wheat. With the latter variety, however, it differs slightly both as to general shape of grain and color. The two samples also differ in composition and measurements of brush and crease. There is also a difference in the color of the young stool. Taking all the differences together they are quite sufficient to separate them into varieties. The resemblance between the Bulgarian and the Turkey Reds is somewhat closer. The main difference being that of color and composition of grain, yet it differs from none of the samples in the variety so much as they differ among themselves, so we need to wait for further development of the plant before separating it from the Turkey Reds.

#### Mammoth Amber Giant. (Page 38)

This wheat will easily pass as a variety in this classification. It differs quite distinctly from its nearest neighbor the Pedigree Giant as was shown under the discussion of the latter variety.

#### Corn Wheat. (Page 40)

As may be seen from the page referred to this variety was the hardest in the series. Its other peculiarities were its very slender grain, very horny texture, and the fact that it failed to withstand the winter which would indicate that it was delicate and might be a spring wheat.

#### Defiance Winter Wheat. (Page 45)

This is a small wheat resembling Turkey Red. It is a fair type of the amber colored grain. The only clearcut distinction,







however, between the two wheats is in the color of the grain. They correspond quite closely in almost all other characteristics both in grain and in young stool, and we must await further development of the plant before making a variety distinction.

Padi. (Page 46)

This is also a small wheat belonging to the same class as Turkey Red. It however possesses characteristics which at once separate the two into varieties. It is pear-shaped, very starchy and soft. Its color and texture immediately separates it from the other small wheats and we need not hesitate to say that among the varieties discussed it is quite distinctly different.

New Wheat. (Page 47)

Not quite enough seed was obtained in this sample to entirely seed the plot and this was the object of first importance, no seed was left to make a seed classification. However the young stool was dark green in color which was a distinguishing feature. A further classification will be found in the half-grown plant and mature plant.

K. B. No. 2 (Page 48)

This wheat has for its nearest counterpart the variety, Wheedling, and only the dissimilar characters need be mentioned here. They are differences in dimension of brush, in color, texture, and form of young stool. The differences, however, are slight and we need further developments before classifying the two as distinct varieties.

Belgolina. (Page 49)



This wheat is by reason of its weight just outside the class of small grained varieties and therefore distinct from them. The closes resembling varieties are Pesterboden and Fultzo Mediterranean. It differs very widely from the latter in percentage composition and is harder. It differs from the former in texture, shape of grain, and form of young stool, aside from other differences. It therefore may here be classified as a variety.

#### Red Hussar. (Page 51)

This wheat is in a class with several varieties as regards weight, but is distinguished from most of them by having a slender grain. Its main difference is the extreme starchy content, only 4% being mixed slightly with horny substance.

#### Pesterboden. (Page 52)

This wheat more closely resembles the Hungarian, but there are plenty of distinguishing features. It is softer, has a higher starch content and differs in color of growing stool. While the grains of both samples may be classed as dull amber in color The Hungarian has a reddish tinge, while the Hungarian has more of a grey.

#### Mealy Wheat. (Page 53)

The sample most nearly resembling this wheat is the mixed variety described on Page 12, but since the latter wheat possesses no variety name, no matter how close they resembled it would exert no influence in condemning the wheat but would rather identify the other under the same name.

This concludes the detailed summary of the different varieties



and a briefer general outline which will be found on the succeeding pages will perhaps aid in giving the results so far obtained.



## CONCLUSION.

No. of varieties classified	Name under which each variety was obtained	Names of varieties which appear from this thesis to be identical.	Names of varieties which appear from this thesis to be distinct.	No. of page in this thesis giving description of varieties in 3rd and 4th column.
1	Indiana Swamp		Indiana Swamp	Pages 50,11,56
2	" "		" "	" " " "
3	Mixed Wheat		Mixed Wheat	" 12, 57
4	Rupert's Giant		Rupert's Giant	" 13, 57
6	Turkey Red	Turkey Reds (5) & Malakoff		" 14,18,22, 26,30,41, 54.
7	Dawson's Golden Chaff		Dawson's Golden Chaff(2)	" 15,31,55.
8	Fultz's Mediterranean		Fultz's Mediterranean	" 16,39, 44,56.
9.	Silver Sheaf Longberry	Silver Sheaf Longberry(1)P 17 Clawson's Longb.	Silver Sheaf Longberry Pg. 31	" 17,42,55
11	Turkey Red		Turkey Red	" 18, 54.
12	Early Red Chief		Early Red Chief	" 19,58.
13	Rural New York No.57		Rural New Yorker No. 57	" 20,58.
14	Jones' Longberry		Jones' Longberry	" 21,43,55
16	Turkey Red			" 54,22
17.	Clawson's Long- berry	See Silver Sheaf Longberry(17)		" 58,22
18.	Gold Coin		Gold Coin	" 60,24





19	Pedigree Giant	Pedigree Giant	Pages 25,60
21	Turkey Red	"	26,54
22	Diamond Grit	Diamond Grit	" 27,61
23	Rural New Yorker No. 6	Rural New Yorker No. 6	" 28,61
24	Malakoff	See Turkey Red	" 29,62
26	Turkey Red	"	30, 54
27	Dawson's Golden Chaff	"	31, 55
28	No. 11603	No. 11603	" 32,62
29	Hungarian	Hungarian	" 33,63
31	Rudy	Rudy	" 34,63
32	Wheedling	Wheedling & K.B.No. 2	" 35,64
33	Harvest King	Harvest King	"36,59
35	Bulgarian	See Turkey Red	" 37,64
36	Mammoth Amber Giant	Mammoth Amber Giant	" 38,65
37	Fultzo Mediteranean	"	39,56
38	Corn Wheat	Corn Wheat	" 40,65
40	Turkey Red	"	41, 54
41	SilverSheaf Longberry	"	31, 55
42	Jones' Longberry	"	43,55



45	Fultz Mediterranean		Page 44,56
45	Defiance Winter Wheat	See Turkey Red	" 45,65
46	Padi	Padi	" 46,66
47	New Wheat	New Wheat	" 47,66
48	K. B. No. 2	See Wheedling	" 48,66
50	Belegolina	Belgolina	" 49,66
51	Indiana Swamp		" 50,56
52	Red Hussar	Red Hussar	" 51,67
53	Pesterboden	Pesterboden	" 52,67
55	Mealy Wheat	Mealy Wheat	" 53,67

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The meaning of the foregoing table is that five samples of Turkey Reds are closely resembled by the varieties so-called Malakoff, Bulgarian, and Defiance Winter Wheat at this stage of the classification; that one sample of Silver Sheaf Longberry and Clawson's Longberry are identical; and that K.B.No.2 and Wheedling have enough similarity to be classed together.









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